

Tornado

A Guide for Your Personal Health and Safety

Department of Health and Human Services
Centers for Disease Control And Prevention

[Introduction](#) | [Tornado Basics](#) | [Severe Weather: Watching for Tornadoes](#) | [Advance Planning at Home](#) | [After a Tornado](#) | [Summary](#)

Introduction

Knowing what to do when you see a tornado, or when you hear a tornado warning, can help protect you and your family. During a tornado, people face hazards from extremely high winds and risk being struck by flying and falling objects. After a tornado, the wreckage left behind poses additional injury risks. Although nothing can be done to prevent tornadoes, there are actions you can take for your health and safety. This pamphlet provides information to help you to watch for tornadoes, to plan ahead to reduce hazards, and to avoid injuries during and after the storm.

Although tornadoes are occasionally reported in other parts of the world, most occur in the United States east of the Rocky Mountains during the spring and summer. However, tornadoes can occur in any state at any time of the year. Nationally, an average of 800 tornadoes are sighted each year, causing about 80 deaths and more than 1,500 injuries.

Tornado Basics

A tornado is a violent whirlwind--a rotating funnel of air that extends from a cloud to the ground. Tornadoes can travel for many miles at speeds of 250 miles per hour or more. These storms change direction without warning, randomly destroying homes and power lines, uprooting trees, and even hurling large objects--such as automobiles--over long distances.

Tornadoes usually accompany severe thunderstorms. Occasionally, tornadoes occur during tropical storms or hurricanes. The path of damage left behind by a tornado averages 9 miles long by 200 yards wide, but a severe tornado can damage an area up to 50 miles long and a mile wide.

Tornadoes that occur over oceans and lakes are called *waterspouts*. Because they rotate less vigorously and affect less-populated areas, waterspouts are usually not as destructive as tornadoes; however, waterspouts can move inland and become tornadoes. Waterspouts are more common in the Southeast, particularly along the Gulf Coast, but can form over any body of warm water.

The most destructive force in a tornado is the updraft in the funnel. As this unstable air moves upward at high speed, it can suction up houses and trees and move them hundreds of feet.

How Tornadoes are Formed

When unseasonably warm humid air collides with a cold front, intense thunderstorm clouds form and tornadoes may develop.

As warm air rises within the storm clouds, cooler air rushes in from the sides, creating a whirling wind that draws surrounding air toward its center.

An area of strong rotation develops, 2 to 6 miles wide. Next to appear is a dark, low cloud base called a rotating wall cloud.

Moments later, as rotation becomes even stronger, a funnel develops.

Severe Weather: Watching for Tornadoes

Stay Tuned for Storm Watches and Warnings

When there are thunderstorms in your area, turn on your radio or TV to get the latest emergency information from local authorities. Listen for announcements of a tornado watch or tornado warning.

Local Warning System

Learn about the tornado warning system of your county or locality. Most tornado-prone areas have a siren system. Know how to distinguish between the siren's warnings for a tornado *watch* and a tornado *warning*.

A **tornado watch** is issued when weather conditions favor the formation of tornadoes, for example, during a severe thunderstorm.

During a tornado **watch**,

- Stay tuned to local radio and TV stations or a National Oceanographic and Atmospheric Administration (NOAA) Weather Radio for further weather information.
- Watch the weather and be prepared to take shelter immediately if conditions worsen.

A **tornado warning** is issued when a tornado funnel is sighted or indicated by weather radar.

You should take shelter immediately.

Thunder Storms

Because tornadoes often accompany thunderstorms, pay close attention to changing weather conditions when there is a severe thunderstorm watch or warning.

A ***severe thunderstorm watch*** means severe thunderstorms are possible in your area.

A ***severe thunderstorm warning*** means severe thunderstorms are occurring in your area.

Keep fresh batteries and a battery-powered radio or TV on hand. Electrical power is often interrupted during thunderstorms--just when information about weather warnings is most needed.

Signs of an Approaching Storm

Some tornadoes strike rapidly, without time for a tornado warning, and sometimes without a thunderstorm in the vicinity. When you are watching for rapidly emerging tornadoes, it is important to know that you cannot depend on seeing a funnel: clouds or rain may block your view. The following weather signs may mean that a tornado is approaching:

- A dark or green-colored sky.
- A large, dark, low-lying cloud.
- Large hail.
- A loud roar that sounds like a freight train.

If you notice any of these weather conditions, take cover immediately, and keep tuned to local radio and TV stations or to a NOAA weather radio.

NOAA Weather Radios

NOAA weather radios are the best way to receive warnings from the National Weather Service. By using a NOAA weather radio, you can receive continuous updates on all the weather conditions in your area. The range of these radios depends on where you live, but the average range is 40 miles. The radios are sold in many stores. The National Weather Service recommends buying a radio with a battery backup (in case the power goes off) and a tone-alert feature that automatically sounds when a weather watch or warning is issued.

Sighting a Funnel Cloud

If you see a funnel cloud nearby, take shelter immediately (see the following section for instructions on shelter). However, if you spot a tornado that is far away, help alert others to the hazard by reporting it to the newsroom of a local radio or TV station before taking shelter as described later. Use common sense and exercise caution: if you believe that you might be in danger, seek shelter immediately.

Taking Shelter

Your family could be anywhere when a tornado strikes--at home, at work, at school, or in the car. Discuss with your family where the best tornado shelters are and how family members can protect themselves from flying and falling debris.

The key to surviving a tornado and reducing the risk of injury lies in planning, preparing, and practicing what you and your family will do if a tornado strikes. Flying debris causes most deaths and injuries during a tornado. Although there is no *completely* safe place during a tornado, some locations are much safer than others.

At Home

Pick a place in the home where family members can gather if a tornado is headed your way. One basic rule is *AVOID WINDOWS*. An exploding window can injure or kill.

The safest place in the home is the interior part of a basement. If there is no basement, go to an inside room, without windows, on the lowest floor. This could be a center hallway, bathroom, or closet.

For added protection, get under something sturdy such as a heavy table or workbench. If possible, cover your body with a blanket, sleeping bag, or mattress, and protect your head with anything available--even your hands. Avoid taking shelter where there are heavy objects, such as pianos or refrigerators, on the area of floor that is directly above you. They could fall through the floor if the tornado strikes your house.

In a Mobile Home

DO NOT STAY IN A MOBILE HOME DURING A TORNADO. Mobile homes can turn over during strong winds. Even mobile homes with a tie-down system cannot withstand the force of tornado winds.

Plan ahead. If you live in a mobile home, go to a nearby building, preferably one with a basement. If there is no shelter nearby, lie flat in the nearest ditch, ravine, or culvert and shield your head with your hands.

If you live in a tornado-prone area, encourage your mobile home community to build a tornado shelter.

On the Road

The least desirable place to be during a tornado is in a motor vehicle. Cars, buses, and trucks are easily tossed by tornado winds.

DO NOT TRY TO OUTFRAN A TORNADO IN YOUR CAR. If you see a tornado, stop your vehicle and get out. Do not get under your vehicle. Follow the directions for seeking shelter outdoors (see next section).

Outdoors

If you are caught outside during a tornado and there is no adequate shelter immediately available--

- Avoid areas with many trees.
- Avoid vehicles.
- Lie down flat in a gully, ditch, or low spot on the ground.
- Protect your head with an object or with your arms.

Long-Span Buildings

A long-span building, such as a shopping mall, theater, or gymnasium, is especially dangerous because the roof structure is usually supported solely by the outside walls. Most such buildings hit by tornados cannot withstand the enormous pressure. They simply collapse.

If you are in a long-span building during a tornado, stay away from windows. Get to the lowest level of the building--the basement if possible--and away from the windows.

If there is no time to get to a tornado shelter or to a lower level, try to get under a door frame or get up against something that will support or deflect falling debris. For instance, in a department store, get up against heavy shelving or counters. In a theater, get under the seats. Remember to protect your head.

Office Buildings, Schools, Hospitals, Churches, and Other Public Buildings

Extra care is required in offices, schools, hospitals, or any building where a large group of people is concentrated in a small area. The exterior walls of such buildings often have large windows.

If you are in any of these buildings--

- Move away from windows and glass doorways.
- Go to the innermost part of the building on the lowest possible floor.
- Do not use elevators because the power may fail, leaving you trapped.
- Protect your head and make yourself as small a target as possible by crouching down.

Shelter for People with Special Needs

Advance planning is especially important if you require assistance to reach shelter from an approaching storm (see specific instructions in the next section).

- If you are in a wheelchair, get away from windows and go to an interior room of the house. If possible, seek shelter under a sturdy table or desk. Do cover your head with anything available, even your hands.
- If you are unable to move from a bed or a chair and assistance is not available, protect yourself from falling objects by covering up with blankets and pillows.
- If you are outside and a tornado is approaching, get into a ditch or gully. If possible, lie flat and cover your head with your arms.

Advance Planning at Home

Important Measures To Take

- Take a few minutes with your family to develop a tornado emergency plan. Sketch a floor plan of where you live, or walk through each room and discuss where and how to seek shelter.
- Show a second way to exit from each room or area. If you need special equipment, such as a rope ladder, mark where it is located.
- Make sure everyone understands the siren warning system, if there's such a system in your area.
- Mark where your first-aid kit and fire extinguishers are located.
- Mark where the utility switches or valves are located so they can be turned off--if time permits--in an emergency.
- Teach your family how to administer basic first aid, how to use a fire extinguisher, and how and when to turn off water, gas, and electricity in your home.
- Learn the emergency dismissal policy for your child's school.
- Make sure your children know--
 - What a tornado is
 - What tornado watches and warnings are
 - What county or parish they live in (warnings are issued by county or parish)
 - How to take shelter, whether at home or at school.

Extra Measures for People with Special Needs

- Write down your specific needs, limitations, capabilities, and medications. Keep this list near you always--perhaps in your purse or wallet.
- Find someone nearby (a spouse, roommate, friend, neighbor, relative, or co-worker) who will agree to assist you in case of an emergency. Give him or her a copy of your list. You may also want to provide a spare key to your home, or directions to find a key.
- Keep aware of weather conditions through whatever means are accessible to you. Some options are closed captioning or scrolled warnings on TV, radio bulletins, or call-in weather information lines.

Practicing Your Emergency Plan

Conduct drills and ask questions to make sure your family remembers information on tornado safety, particularly how to recognize hazardous weather conditions and how to take shelter.

Writing Down Important Information

A [blank form](#) for you to write down important names and numbers is on the back cover of this pamphlet.

Make a list of important information. Include these on your list:

- Important telephone numbers, such as emergency (police and fire), paramedics, and medical centers.
- Names, addresses, and telephone numbers of your insurance agents, including policy types and numbers.
- Telephone numbers of the electric, gas, and water companies.
- Names and telephone numbers of neighbors.
- Name and telephone number of your landlord or property manager.
- Important medical information (for example, allergies, regular medications, and brief medical history).
- Year, model, license, and identification numbers of your vehicles (automobiles, boats, and RVs).
- Bank's or credit union's telephone number, and your account numbers.
- Radio and television broadcast stations to tune to for emergency broadcast information.

Storing Important Documents

Store the following documents in a fire- and water-proof safe:

- Birth certificates
- Ownership certificates (autos, boats, etc.)
- Social security cards
- Insurance policies
- Will
- Household inventory
 - List of contents of household; include serial numbers, if applicable
 - Photographs or videotape of contents of every room
 - Photographs of items of high values, such as jewelry, paintings, collection items

First Aid Kit
<p>Store your first aid supplies in a tool box or fishing tackle box so they will be easy to carry and be protected from water. Inspect your kit regularly and keep it freshly stocked.</p> <p><i>Drugs and Medications</i></p> <ul style="list-style-type: none"> • Hydrogen peroxide to wash and disinfect wounds • Antibiotic ointment • Individually wrapped alcohol swabs • Aspirin and non-aspirin tablets • Prescriptions and any long-term medications (keep these current)

- Diarrhea medicine
- Eye drops

NOTE: Important medical information and most prescriptions can be stored in the refrigerator, which provides excellent protection from fires.

Dressings

- Band-aids
- Clean sheets torn into strips
- Elastic bandages
- Rolled gauze
- Cotton-tipped swabs
- Adhesive tape roll

Other First Aid Supplies

- First aid book
- Writing materials
- Scissors
- Tweezers
- Thermometer
- Bar soap
- Tissues
- Sunscreen
- Paper cups
- Plastic bags
- Safety pins
- Needle and thread
- Instant cold packs for sprains
- Sanitary napkins
- Pocket knife
- Splinting materials

Reducing Household Hazards

Home Inspection Checklist

The following suggestions will reduce the risk for injury during or after a tornado. No amount of preparation will *eliminate* every risk.

Possible Hazards

Inspect your home for possible hazards, including the following:

- Are walls securely bolted to the foundation?
- Are wall studs attached to the roof rafters with metal hurricane clips, not nails?

Utilities

- Do you know where and how to shut off utilities at the main switches or valves?

Home Contents

- Are chairs or beds near windows, mirrors, or large pictures?
- Are heavy items stored on shelves more than 30" high?
- Are there large, unsecured items that might topple over or fall?
- Are poisons, solvents, or toxic materials stored safely ?

Securing Your Home's Structure

No home is completely safe in a tornado. However, attention to construction details can reduce damage and provide better protection for you and your family if a tornado should strike your house. If an inspection using the "Home Inspection Checklist" reveals a possible hazard in the way your home is constructed, contact your local city or county building inspectors for more information about structural safety. They may also offer suggestions on finding a qualified contractor to do any needed work for you.

Walls and Roof Rafters

Strengthen the areas of connection between the wall studs and roof rafters with hurricane clips as shown in the above graphic.

Shutting Off Utilities

Gas

After a tornado, DO NOT USE matches, lighters, or appliances, or operate light switches until you are sure there are no gas leaks. Sparks from electrical switches could ignite gas and cause an explosion.

If you smell the odor of gas or if you notice a large consumption of gas being registered on the gas meter, shut off the gas immediately. First, find the main shut-off valve located on a pipe next to the gas meter. Use an adjustable wrench to turn the valve to the "off" position.

Electricity

After a major disaster, shut off the electricity. Sparks from electrical switches could ignite leaking gas and cause an explosion.

Water

- Water may be turned off at either of two locations:
 1. At the main meter, which controls the water flow to the entire property.
 2. At the water main leading into the home. If you may need an emergency source of fresh water, it is better to shut off your water here, because it will conserve the water in your water heater.
- Attach a valve wrench to the water line. (This tool can be purchased at most hardware stores.)
- Label the water mains for quick identification.

Arranging and Securing Household Items

- Arrange furniture so that chairs and beds are away from windows, mirrors, and picture frames.
- Place heavy or large items on lower shelves.
- Secure your large appliances, especially your water heater, with flexible cable, braided wire, or metal strapping.
- Identify top-heavy, free-standing furniture, such as bookcases and china cabinets, that could topple over.
- Secure your furniture by using one of two methods.
 1. "L" brackets, corner brackets, or aluminum molding, to attach tall or top-heavy furniture to the wall.
 2. Eyebolts, to secure items located a short distance from the wall.
- Install sliding bolts or childproof latches on all cabinet doors.
- Store all hazardous materials such as poisons and solvents--
 - in a sturdy, latched or locked cabinet
 - in a well-ventilated area
 - away from emergency food or water supplies

After a Tornado

Injury may result from the direct impact of a tornado, or it may occur afterward when people walk among

debris and enter damaged buildings. A study of injuries after a tornado in Marion, Illinois, showed that 50 percent of the tornado-related injuries were suffered during rescue attempts, cleanup, and other post-tornado activities. Nearly a third of the injuries resulted from stepping on nails. Other common causes of injury included falling objects and heavy, rolling objects. Because tornadoes often damage power lines, gas lines, or electrical systems, there is a risk of fire, electrocution, or an explosion. Protecting yourself and your family requires promptly treating any injuries suffered during the storm and using extreme care to avoid further hazards.

Injuries

Check for injuries. Do not attempt to move seriously injured people unless they are in immediate danger of further injury. Get medical assistance immediately. If someone has stopped breathing, begin CPR if you are trained to do so. Stop a bleeding injury by applying direct pressure to the wound. Have any puncture wound evaluated by a physician. If you are trapped, try to attract attention to your location.

General Safety Precautions

Here are some safety precautions that could help you avoid injury after a tornado:

- Continue to monitor your battery-powered radio or television for emergency information.
- Be careful when entering any structure that has been damaged.
- Wear sturdy shoes or boots, long sleeves, and gloves when handling or walking on or near debris.
- Be aware of hazards from exposed nails and broken glass.
- Do not touch downed power lines or objects in contact with downed lines. Report electrical hazards to the police and the utility company.
- Use battery-powered lanterns, if possible, rather than candles to light homes without electrical power. If you use candles, make sure they are in safe holders away from curtains, paper, wood, or other flammable items. Never leave a candle burning when you are out of the room.
- Hang up displaced telephone receivers that may have been knocked off by the tornado, but stay off the telephone, except to report an emergency.
- Cooperate fully with public safety officials.
- Respond to requests for volunteer assistance by police, fire fighters, emergency management, and relief organizations, but do not go into damaged areas unless assistance has been requested. Your presence could hamper relief efforts, and you could endanger yourself.

Inspecting the Damage

- After a tornado, be aware of possible structural, electrical, or gas-leak hazards in your home. Contact your local city or county building inspectors for information on structural safety codes and standards. They may also offer suggestions on finding a qualified contractor to do work for you.

- In general, if you suspect any damage to your home, shut off electrical power, natural gas, and propane tanks to avoid fire, electrocution, or explosions.
- If it is dark when you are inspecting your home, use a flashlight rather than a candle or torch to avoid the risk of fire or explosion in a damaged home.
- If you see frayed wiring or sparks, or if there is an odor of something burning, you should immediately shut off the electrical system at the main circuit breaker if you have not done so already.
- If you smell gas or suspect a leak, turn off the main gas valve, open all windows, and leave the house immediately. Notify the gas company, the police or fire departments, or State Fire Marshal's office, and do not turn on the lights, light matches, smoke, or do anything that could cause a spark. Do not return to your house until you are told it is safe to do so.

Safety During Clean Up

- Wear sturdy shoes or boots, long sleeves, and gloves.
- Learn proper safety procedures and operating instructions before operating any gas-powered or electric-powered saws or tools.
- Clean up spilled medicines, drugs, flammable liquids, and other potentially hazardous materials.

Children's Needs

After a tornado, children may be afraid the storm will come back again and they will be injured or left alone. Children may even interpret disasters as punishment for real or imagined misdeeds. Explain that a tornado is a natural event.

Children will be less likely to experience prolonged fear or anxiety if they know what to expect after a tornado. Here are some suggestions:

- Talk about your own experiences with severe storms, or read aloud a book about tornadoes.
- Encourage your child to express feelings of fear. Listen carefully and show understanding.
- Offer reassurance. Tell your child that the situation is not permanent, and provide physical reassurance through time spent together and displays of affection.
- Include your child in clean-up activities. It is comforting to children to watch the household begin to return to normal and to have a job to do.

NOTE: Symptoms of anxiety may not appear for weeks or even months after a tornado; they can affect people of any age. If anxiety disrupts daily activities for any member of your family, seek professional assistance through a school counselor, community religious organization, your physician, or a licensed professional. Counselors are listed under *Mental Health Services* in the yellow pages of your telephone directory.

Summary

Because tornadoes are the most unpredictable of storms, the time between the first warning of a tornado and its arrival may be very short. Sometimes, weather conditions change so rapidly that no tornado warning is possible. It is important that you and your family plan for an emergency by reducing home safety hazards, learning to recognize the signs of an approaching tornado, learning the emergency warning system for your area, and finding out how to reach the best available shelter.

This information is provided by the National Center for Environmental Health, Centers for Disease Control and Prevention (CDC) through state and local health departments. It includes general injury-prevention guidelines to help protect you and your family. Because conditions may vary slightly from state to state, contact your local or state health department for recommendations particular to your area.

[Introduction](#) | [Tornado Basics](#) | [Severe Weather: Watching for Tornadoes](#) | [Advance Planning at Home](#) | [After a Tornado](#) | [Summary](#)

See also the [Spanish version](#) of this page.

[CDC Prevention Guides for Emergencies and Disasters](#)